

distortion or changes in the alignment. Some other types of machine tools also have a three-point support and this principle is applied to machine design in various ways to secure a solid support, to equalize strains, etc. Castings for various purposes are often made with three projecting lugs or bosses in order to gain a good bearing surface under all conditions. In the design of fixtures, the principle of three-point support is used in many ways, on both rough and finished work and on all varieties of machines. In this chapter we shall consider its application to fixtures for horizontal and vertical turret lathe work, and in order to make the matter as clear as possible, simple examples have been selected to illustrate the subject and to avoid complications.

Three-point Locating and Clamping Devices. — In applying the three-point principle for the location and support of rough castings or forgings, there are several important points to consider. To begin with, it is well to make sure that none of the points will strike against a fin or parting seam, or come against the portion of the work on which the piece number may be imprinted. If the work is to be located from two rough surfaces at right angles to each other, it must be remembered that, if three fixed points are used as locators on one side, the other points must be arranged so that only one is fixed, and two are adjustable to compensate for variations in the surfaces. When the work is shallow and is held in chuck jaws, this point may be neglected, as the work can rest on three points and be gripped by the jaws.

When a finished surface is used for centering a piece in a fixture, and it also rests on a finished surface, the three supporting points may be fixed. If the work is to be damped as on a faceplate fixture, the clamps should be arranged so that they will draw the piece directly down or back upon the supports in order to avoid any chance of tilting or distortion. When a finished surface is used for centering the work and a rough one for end location, the points must be arranged the same as for handling rough castings, i.e., with two of them adjustable. It is often desirable on large work to locate the